

TO: Examiner Jimenez

FROM: Eric Jensen of Young & Thompson

Re: 09/486,262

1.(currently amended) A paper feed roller for use in printing machines comprising:

a rotary shaft, and

a cylindrical roller portion integrated with an outer periphery of the rotary shaft;

wherein the cylindrical roller portion comprises a hydraulic composition comprising a hydraulic powder and a non-hydraulic powder and a workability improver,

and said non-hydraulic powder is at least one selected from the group consisting of calcium carbonate powder, slug powder, fly ash powder, silica powder and silica fume powder, and said workability improver is one of a powder and an emulsion of at least one resin selected from the group consisting of: vinyl acetate resin, a copolymer resin with vinyl acetate, acrylic resin, a copolymer resin with acryl, styrene resin, a copolymer resin with styrene, and an epoxy resin.

2.(original) The paper feed roller set forth in claim 1, wherein the rotary shaft is constituted by two rotary shaft portions, said two rotary shaft portions are aligned with each other and axially inwardly inserted integrally into central portions of respective opposite end faces of the cylindrical roller portion from opposite sides such that the rotary shaft portions are concentric with an outer peripheral face of the cylindrical roller portion.

3.(currently amended) A paper feed roller for use

in printing machines comprising:

a rotary shaft, and

a cylindrical roller portion integrated with an outer periphery of the rotary shaft and formed by connecting a plurality of cylindrical molded bodies in a direction of the rotary shaft;

wherein the cylindrical roller portion comprises a hydraulic composition comprising a hydraulic powder and a non-hydraulic powder and a workability improver,

and said non-hydraulic powder is at least one selected from the group consisting of calcium carbonate powder, slug powder, fly ash powder, silica powder and silica fume powder, and said workability improver is one of a powder and an emulsion of at least one resin selected from the group consisting of: vinyl acetate resin, a copolymer resin with vinyl acetate, acrylic resin, a copolymer resin with acryl, styrene resin, a copolymer resin with styrene, and an epoxy resin.

4.(original) The paper feed roller set forth in claim 3, wherein at least one set of two adjacent cylindrical molded bodies connected is connection-reinforced with a connecting core rod extending over the two cylindrical molded bodies.

5.(previously presented) The paper feed roller set forth in claim 3, wherein connecting end portions of the cylindrical molded bodies to be connected to each other have interengaging shapes, and said cylindrical molded bodies are connected by engagement at said end portions.

6.(currently amended) The paper feed roller set forth in claim 1, wherein the hydraulic composition comprises 100 parts by weight of a mixed powder and 2 to 18 parts by weight of the workability improver, said mixed powder comprising 50 to 90% by weight of the hydraulic powder and 10 to 50% by weight of the non-hydraulic powder, and said non-hydraulic powder having an average particle diameter smaller than that of the hydraulic powder by an order of one digit or more.

7. (cancelled)

8.(currently amended) A method for producing a paper feed roller for use in printing machines, comprising the steps of:

forming a plurality of cylindrical molded bodies, each of which bodies having a hole at a center portion, by press molding, releasing, curing and hardening a hydraulic composition comprising a hydraulic powder and a non-hydraulic powder and a workability improver,

inserting a rotary shaft through the holes of the plurality of the cylindrical molded bodies, and

connecting adjacent said cylindrical molded bodies, and thereby integrally forming a cylindrical roller portion around an outer peripheral surface of the rotary shaft;

wherein said non-hydraulic powder is at least one selected from the group consisting of calcium carbonate powder, slug powder, fly ash powder, silica powder and silica fume powder, and the workability improver is one of a powder and an emulsion of at least one resin selected

from the group consisting of: vinyl acetate resin, a copolymer resin with vinyl acetate, acrylic resin, a copolymer resin with acryl, styrene resin, a copolymer resin with styrene, and an epoxy resin.

9.(original) The paper feed roller-producing method set forth in claim 8, wherein connecting end portions of the cylindrical molded bodies to be connected to each other are molded to have interengaging shapes, and said cylindrical molded bodies are connected by engagement at said end portions.

10.(currently amended) A method for producing a paper feed roller for use in printing machines, comprising the steps of:

forming a plurality of cylindrical green press molded bodies each having a hole at a central portion by press molding a mixture of a hydraulic composition comprising a hydraulic powder and a non-hydraulic powder and a workability improver,

releasing the cylindrical green press molded bodies,

inserting a rotary shaft through the holes of the plurality of the cylindrical green press molded bodies,

connecting adjacent said cylindrical green press molded bodies, and

forming a cylindrical shaped body through curing and hardening the connected cylindrical green press molded bodies, so as to integrally form a cylindrical roller portion around an outer peripheral surface of the rotary shaft;

wherein said non-hydraulic powder is at least one selected from the group consisting of calcium carbonate powder, slug powder, fly ash powder, silica powder and silica fume powder, and the workability improver is one of a powder and an emulsion of at least one resin selected from the group consisting of: vinyl acetate resin, a copolymer resin with vinyl acetate, acrylic resin, a copolymer resin with acryl, styrene resin, a copolymer resin with styrene, and an epoxy resin.

11.(currently amended) The paper feed roller-producing method set forth in claim 10, wherein connecting end portions of the cylindrical green press molded bodies to be connected to each other are molded to have interengaging shapes, and said cylindrical green press molded bodies are connected by engagement at said end portions.

12.(currently amended) A method for producing a paper feed roller for use in printing machines, comprising the steps of:

forming a cylindrical roller portion from a cylindrical press molded body shaped through press molding, releasing, curing and hardening a hydraulic composition comprising a hydraulic powder and a non-hydraulic powder and a workability improver,

arranging two rotary shaft portions to be concentric with an outer peripheral surface of the cylindrical roller portion, and

attaching the two rotary shaft portions to opposite end portions of the cylindrical roller portion,

the two rotary shaft portions being aligned with each other, so as to form a rotary shaft by the two rotary shaft portions;

wherein said non-hydraulic powder is at least one selected from the group consisting of calcium carbonate powder, slug powder, fly ash powder, silica powder and silica fume powder, and the workability improver is one of a powder and an emulsion of at least one resin selected from the group consisting of: vinyl acetate resin, a copolymer resin with vinyl acetate, acrylic resin, a copolymer resin with acryl, styrene resin, a copolymer resin with styrene, and an epoxy resin.

13.(previously presented) The paper feed roller-producing method set forth in claim 12, wherein the cylindrical press molded body is formed such as holes are produced at center portions of opposite end portions of the cylindrical roller portion to make the holes concentric with the outer peripheral surface of the cylindrical roller portion, the two rotary shaft portions being inserted and integrally fixed into the holes, respectively, such that the rotary shaft portions are aligned with each other, and thereby the rotary shaft is constituted by the two rotary shaft portions.

14.(previously presented) The paper feed roller-producing method set forth in claim 12, wherein a screw portion is provided at one end portion of the rotary shaft portion, and the rotary shaft portion is attached to the end portion of the cylindrical roller portion by screwing the screw portion of the rotary shaft portion thereinto.

15.(currently amended) The paper feed roller-producing method set forth in claim 12, wherein a plurality of cylindrical press molded bodies are formed through press molding, releasing, curing and hardening the hydraulic composition, and the cylindrical roller portion is formed by connecting the cylindrical press molded bodies together.

16.(currently amended) The paper feed roller-producing method set forth in claim 15, wherein at least one set of adjacent cylindrical press molded bodies are connected by a connecting core rod.

17.(currently amended) The paper feed roller-producing method set forth in claim 15, wherein connecting end portions of the cylindrical press molded bodies to be connected to each other are molded to have interengaging shapes, and said cylindrical press molded bodies are connected by engagement at said end portions.

18.(currently amended) A method of producing a paper feed roller for use in printing machines, comprising the steps of:

press molding a hydraulic composition comprising a hydraulic powder and a non-hydraulic powder and a workability improver to produce cylindrical green press molded bodies,

releasing the cylindrical green press molded bodies,

forming a cylindrical roller portion from the cylindrical green press molded bodies,

arranging two rotary shaft portions to be



concentric with an outer peripheral surface of the cylindrical roller portion, and

attaching the two rotary shaft portions to opposite end portions of the cylindrical roller portion, the two rotary shaft portions being aligned with each other, so as to form a rotary shaft by the two rotary shaft portions, and

curing and hardening the cylindrical roller portion while arranged on the rotary shaft;

wherein said non-hydraulic powder is at least one selected from the group consisting of calcium carbonate powder, slug powder, fly ash powder, silica powder and silica fume powder, and the workability improver is one powder and an emulsion of at least one resin selected from the group consisting of: vinyl acetate resin, a copolymer resin with vinyl acetate, acrylic resin, a copolymer resin with acryl, styrene resin, a copolymer resin with styrene, and an epoxy resin.

19.(previously presented) The paper feed roller-producing method set forth in claim 18, wherein the cylindrical green molded bodies are formed such that holes are provided at center portions of opposite end portions of the cylindrical roller portion to make the holes concentric with the outer peripheral surface of the cylindrical roller portion, the two rotary shaft portions being inserted and integrally fixed into the holes, respectively, such that the rotary shaft portions are aligned with each other, and thereby the rotary shaft is constituted by the two rotary shaft portions.

20.(previously presented) The paper feed roller-producing method set forth in claim 18, wherein a screw portion is provided at one end portion of the rotary shaft portion, and the rotary shaft portion is attached to the end portion of the cylindrical roller portion by screwing the screw portion of the rotary shaft portion thereinto.

21.(currently amended) The paper feed roller-producing method set forth in claim 18, wherein a plurality of cylindrical green press molded bodies are formed by molding and releasing the hydraulic composition and the cylindrical green press molded bodies are connected together, and the connected green press molded bodies are cured and hardened to form the cylindrical roller portion.

22.(previously presented) The paper feed roller-producing method set forth in claim 19, wherein at least one set of adjacent said cylindrical green press molded bodies are connected by a connecting core rod.

23.(currently amended) The paper feed roller-producing method set forth in claim 21, wherein connecting end portions of the cylindrical green press molded bodies to be connected to each other are molded to have interengaging shapes, and said cylindrical green press molded bodies are connected by engagement at said end portions.

24.(cancelled)

25.(cancelled)

26.(cancelled)

27.(cancelled)

28.(cancelled)

29.(cancelled)

30.(cancelled)

31.(new) The paper feed roller set forth in claim 3, wherein the rotary shaft is constituted by two rotary shaft portions, said two rotary shaft portions are aligned with each other and axially inwardly inserted integrally into central portions of respective opposite end faces of the cylindrical roller portion from opposite sides such that the rotary shaft portions are concentric with an outer peripheral face of the cylindrical roller portion.